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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,729	03/29/2004	Tomoaki Toda	119312	9667
25944	7590	11/03/2006		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER SAYADIAN, HRAYR	
			ART UNIT 2828	PAPER NUMBER

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/810,729	TODA, TOMOAKI	
	<b>Examiner</b>	<b>Art Unit</b>	
	Hrayr A. Sayadian	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 11-13, 15, 16, 19 and 25-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-13, 15, 16, 19 and 25-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/29/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**Objection to the Amendment – New Matter**

1. The amendment filed 8/9/2006 is objected to under 35 U.S.C. §132(a) because it introduces new matter into the disclosure. 35 U.S.C. §132(a) prohibits any amendment from introducing new matter into the disclosure of the invention.

Specifically, the amendment adds material not supported by the original disclosure as follows: Claims 1-5, 11-13, 15, 16, 19, and 25-30 now recite "controlling to adjust" and "adjusting ... by controlling" instead of "is controlling ... [by driving]," which new recitations lack bases in the disclosure as originally filed.

Additionally, the amendment adds material not supported by the original disclosure as follows: Claims 16, 19, and 25-30 now recite two "constituting ..." lacking antecedent bases in the disclosure as originally filed.

Applicant is required to cancel the new matter in the reply to this Office Action.

**Claim Rejections - 35 U.S.C. § 112**

2. The following is a quotation of the first and second paragraphs of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5, 11-13, 15, 16, 19, and 25-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter not described in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

4. Claim 28 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter Applicant regards as the invention.

Specifically, in claims 1-5, 11-13, 15, 16, 19, and 25-30, the recitations "the first bipolar transistor" and "the second bipolar transistor" lack proper antecedent bases. The claims provide bases for a first and second layers "functioning" as a first and second bipolar transistors, but "functioning ... layer group as a ... transistor" does not provide proper bases for "the" "first transistor" nor for "the" "second transistor."

Additionally, in dependent claim 28, the recitation "said "III-V" group semiconductor lacks antecedent basis.

Correction is required.

#### **Claim Rejections - 35 USC § 102**

5. Claims 1-24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,677,52 to Ogura [hereinafter "Ogura"].

**With respect to claim 1:** As to claim interpretation, the recitation "successively" in claims 1-5, 11-13, and 15 is read broadly to include following each other but not necessarily without other layers in between (see claim 13 reciting a traveling layer between the earlier recited successive p-type base and active layers).

As to claim rejection, Ogura discloses a semiconductor laser (see for example Ogura column 3, lines 29-35) comprising a semiconductor layer group, wherein said semiconductor layer group is composed of an n-type emitter layer (see, for example, column 2, lines 3-4) a p-type base layer (column 2, lines 4-6), an active layer (column 2, lines 30-34), an n-type base layer (column 2, lines 6-7), and a p-type emitter layer (column 2, lines 7-8) which are successively formed on a given substrate. See also FIG. 1, as described in column 3, line 66 to column 4, line 31.

The recitation defining the first semiconductor layer group functioning as a bipolar transistor verbally defines the layers forming one of the two bipolar transistors forming any thyristor, which layers are disclosed by Ogura. Such recitation fails to further structurally narrow scope of claim 1.

The recitation defining the second semiconductor layer group functioning as a bipolar transistor verbally defines the layers forming one of the two bipolar transistors forming any thyristor, which layers are disclosed by Ogura. Such recitation fails to further structurally narrow scope of claim 1.

Controlling the amount of holes or electrons, or both, to be injected into the active layer in the device disclosed by Ogura will modulate the intensity of light generated and oscillated for example, by turning on and off the device disclosed by Ogura.

**With respect to claims 2-5:** The additional recitations in claims 2-5 are directed to intended manner of using the laser diode. The device disclosed in Ogura reads on claim 1, from which claims 2-5 depend, and the device disclosed in Ogura can be used in the intended manner recited in claims 2-5.

**With respect to claim 11 and 12:** See for example Ogura column 3, line 66 to column 4, line 39, describing FIGs. 1 and 2 and disclosing making the semiconductor layer group of III-V semiconductor compound (GaAs).

**With respect to claims 13 and 15:** See for example Ogura column 3, lines 35-46, describing the make and function of layer 31 of FIG. 1. See also FIG. 2 showing InGaAs as partly making the layer 31.

**With respect to claims 16, 19, 25, and 26:** As to claim interpretation applying to claims 16, 19, and 25-30, the recitation "successively" in claims 16, 19, and 25-30 is read broadly to include the layers following each other but not necessarily without other layers in between (see claim 13 reciting a traveling layer between the earlier recited successive p-type base and active layers). Moreover, the recitations in claims 16, 19, and 25-30 presenting "to [cause an effect]" is an intended purpose recitation not specifically presenting the step of "[causing an effect]," which recitations do not further narrow the recited method steps.

As to rejection of claims 16, 19, 25, and 26, Ogura discloses a method for oscillating a semiconductor layer group composed of an n-type emitter layer, a p-type base layer, an active layer, an n-type base layer and a p-type emitter layer which are successively formed on a given substrate, comprising a step of: applying a voltage to said active layer to generate a drift current therein (See for example FIG. 4, control light 61 through transistor 41, and control light 62 through transistor 40, as changing the affect of bias source 50 on the second/third opposite conductivity layers; the application of reset light 62 on transistor 40 backward biases the second/third conductivity layers with the active region in between by raising the voltage of the n layer, to which the emitter of transistor 40 is connected, with respect to the p layer below it; this backward biasing generates a drift current, which passes through the active region and thus generates and oscillates light of a given wavelength; see column 5, lines 8-29, describing the embodiment of FIG.4) so that said active layer is excited by said drift current to generate and oscillate a light of a given wavelength.

Ogura also discloses applying a voltage to said active layer to generate a diffusion current therein (see for example FIG. 4, the control light 61 on transistor 41 forward biases the second/third opposite conductivity layers with the active region in between; this forward biasing generates a diffusion current, which passes through the active region and thus generates and oscillates light of a given wavelength; see column 5, lines 8-29, describing the embodiment of FIG.4) so that said active layer is excited by said diffusion current to generate and oscillate a light of a given wavelength.

The application of a forward voltage smaller than an inherent barrier voltage has a scope including the applied voltage changing from backward to forward and thus going through the various values of forward voltage, including being smaller than the inherent barrier voltage.

**With respect to claim 27:**

The semiconductor layer group disclosed By Ogura is made GaAs substrate and various III-V group compounds.

**With respect to claim 28:**

The semiconductor layer group disclosed By Ogura is includes InGaAs, which is defined as the formula in claim 28, wherein y, but not x, is zero.

**With respect to claims 29 and 30:**

The structure between active layer and the p-type base layer disclosed by Ogura includes at least one layer (any of the wells InGaAs) allowing the traveling of electrons, whereby current oscillation due to Gunn effect when generated in/by the GaAs (the GaAs being disclosed by Ogura) achieves a high-speed modulation of light intensity.

**Response to Applicant's Argument(s)**

6. Applicant argues the claims 1 and 16 now presented are directed to an NPANP structure functioning as two bi-polar transistors, whereas Ogura discloses a thyristor laser wherein only two or three electrodes are coupled to some parts of the layers in the disclosed PNP.

Contrary to this assertion, however, Ogura discloses an NPANP structure (same as in claims 1 and 16) and discloses in FIG. 4 all four electrodes of the disclosed structure are coupled and being used.

Applicant also argues that "claimed invention" is an NPN structure and a PNP structure included in a single NPANP structure. Contrary to this assertion however the disclosed and claimed invention in this application is directed to NPANP (A being an active layer). And this structure is anticipated by Ogura because Ogura discloses an NPANP structure. Therefore whatever transistor-like functioning Applicant attributes to the claimed devices are anticipated by the same functioning of the Ogura disclosed structure anticipating Applicant's claimed structure.

And Applicant argues "the laser GaAs system disclosed by Ogura does not contribute to Gun[sic]-effect." "On the other hand, the features of claims 11-15 of the invention can generate a Gunn-effect."

Examiner notes that claim 14 has been cancelled. Moreover, Examiner notes that the argument of "features" in claims 11, 12, 13, and 15 of the present application being

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capable of generating "Gunn-effect" are arguments directed to features not in the claims. Furthermore, as notoriously well known in the art, GaAs is a material capable of generating Gunn-effect and therefore the laser system of Ogura (which includes GaAs), contrary to Applicant's assertion, can generate Gunn-effect.

### CLOSURE

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hrayr A. Sayadian whose telephone number is (571) 272-7779. The examiner can normally be reached Monday through Friday, 7:30 am – 4:00 pm.

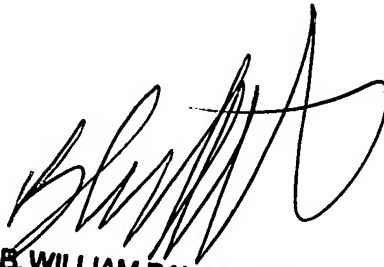
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun O. Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**B. WILLIAM BAUMEISTER**  
**SUPERVISORY PATENT EXAMINER**